Passaic River Basin General Reevaluation

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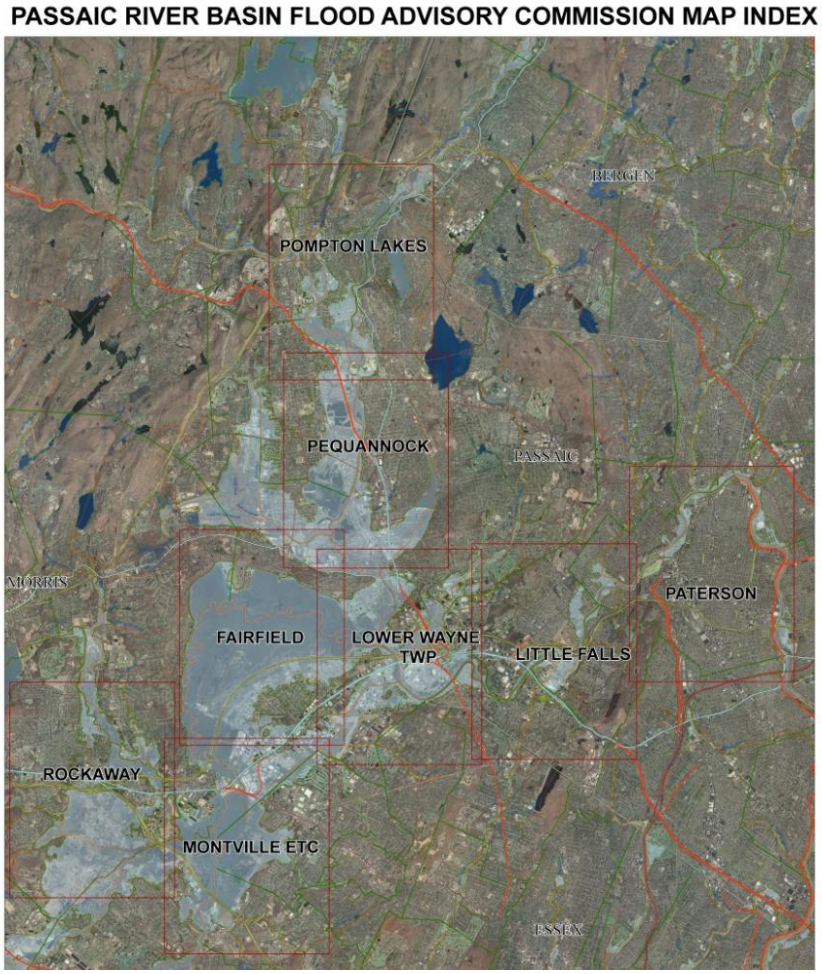
13 September 2012
Wayne, NJ



US Army Corps of Engineers
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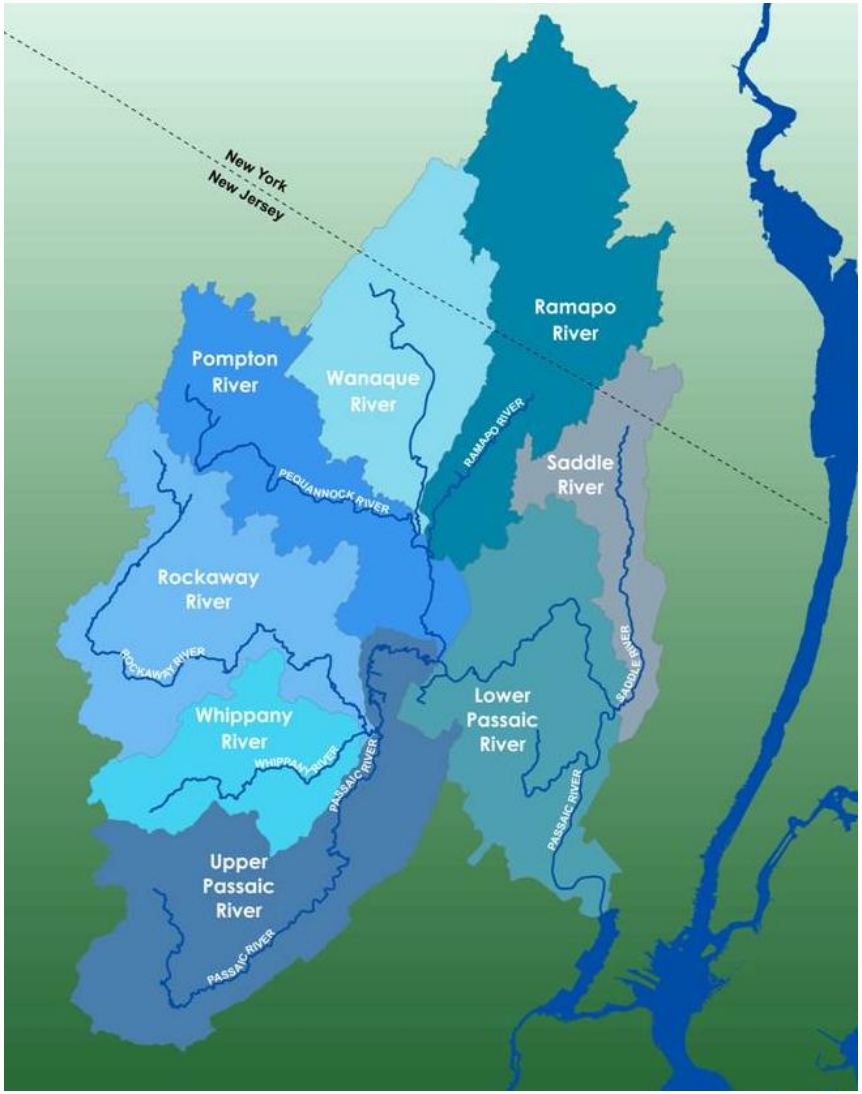
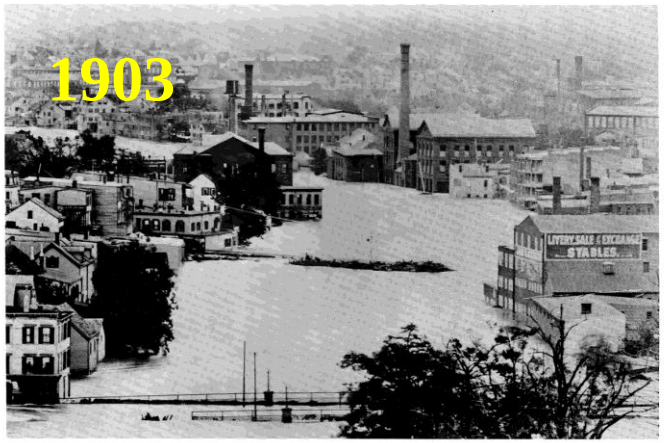
Passaic River Basin Facts

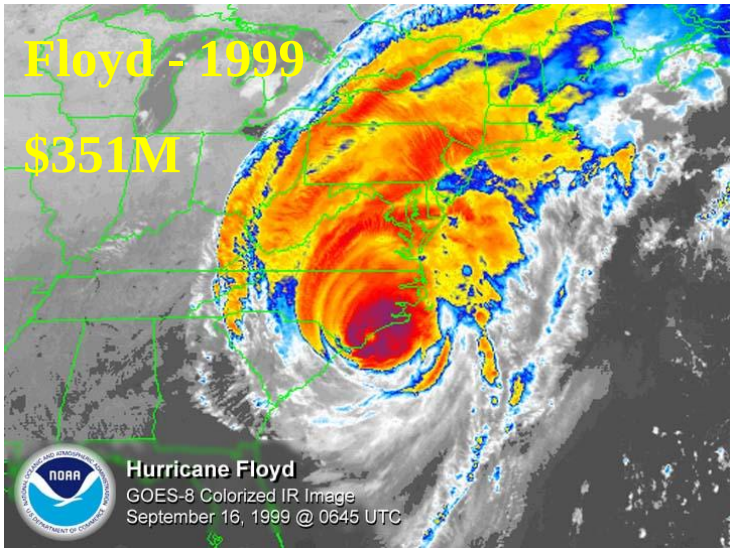


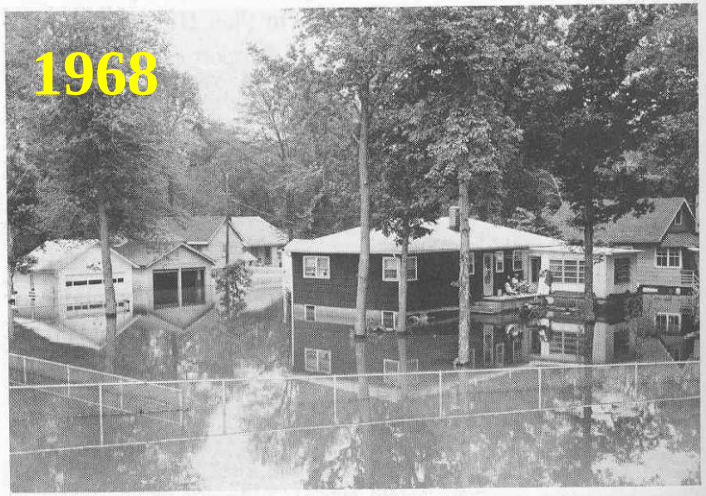
- 983 square mile basin
- ~2.5 million people (2000 census)
- ~50,000 people are in floodplain
- 20,000 homes, businesses, & public buildings in over 100 municipalities
- Main Stem & major tributaries 100 year floodplain covers 40,000 acres (~60 mi^2) of which half is fully developed
- One of the most densely developed floodplains on the eastern seaboard
- Extensive environmental degradation to river system coupled with significant repetitive flooding
- Nine Congressional Districts in basin

Passaic River Basin - Flooding History



Passaic River flood of 1903 in Paterson, showing bridges awash. *Photo by G. K. Livitsanos, Passaic County Historical Collections*





Flooded homes in Fairfield in May, 1968. *Photo by Gene Collerd, courtesy of the* Caldwell Progress

Passaic River Basin - Flooding History

Passaic River Basin Flood Facts

- 15 Federal disaster declarations since 1968
  - 6 of those since 2005
- Since 1900 - 26 lives lost & over **$6 billion** in losses
- Since 1990 – over **$3.5 billion** in losses

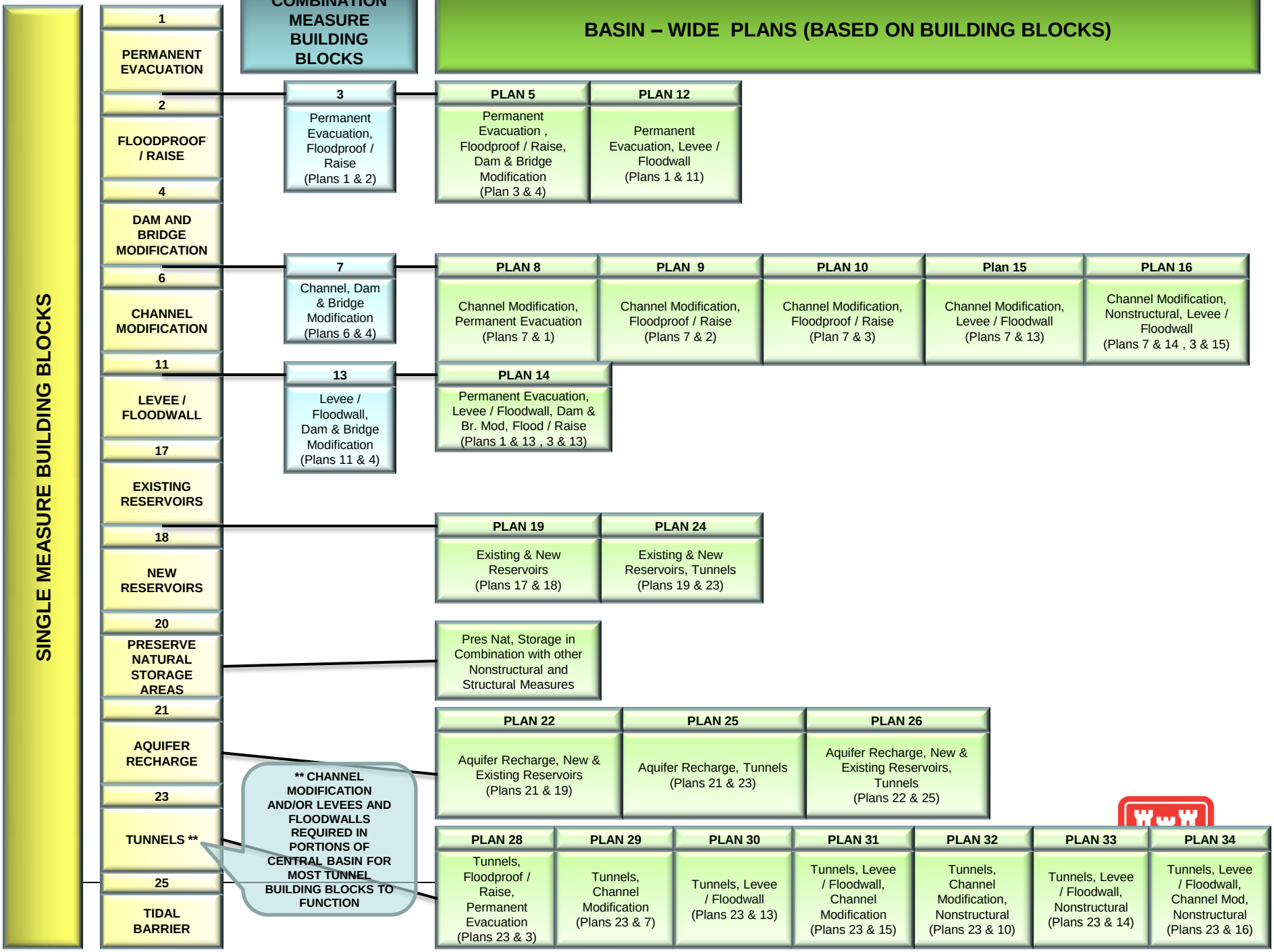
Passaic River Basin – Previous Studies

- 1900 - 1940 ------- 8 State Studies
- 1936 - 1973 ------- 5 Federal Reports
- 1976 ---------- New Basin Study Authorized

  150 alternatives studied including buy-outs, flood plain regulations, channels, levees, floodwalls, reservoirs, tunnels, and multiple combinations

  Consider environmental impacts (NEPA) and Public Acceptance

- 1987 Feasibility General Design Memorandum (GDM) and 1989 Chief's Report
- 1989 Beatties Dam Reconnaissance Report – No Federal Interest
- WRDA 1990 Project Authorization
- September 1995 – Passaic River draft GDM (authorized project)
- September 1995 – Passaic River Buyout Study Report BCR of 0.1 (100 year)
- October 1995 – Passaic River Floodway Buyout Study Report BCR of 0.2
- WRDA 2000, Section 327(i) Restriction on use of funds
- February 2011 – Governor's Flood Advisory Commission Report


SINGLE MEASURE BUILDING BLOCKS
1
PERMANENT EVACUATION
2
FLOODPROOF / RAISE
4
DAM AND BRIDGE MODIFICATION
6
CHANNEL MODIFICATION
11
LEVEE / FLOODWALL
17
EXISTING RESERVOIRS
18
NEW RESERVOIRS
20
PRESERVE NATURAL STORAGE AREAS
21
AQUIFER RECHARGE
23
TUNNELS **
25
TIDAL BARRIER
COMBINATION MEASURE BUILDING BLOCKS
BASIN – WIDE PLANS (BASED ON BUILDING BLOCKS)
3
Permanent Evacuation, Floodproof / Raise (Plans 1 & 2)
PLAN 5
Permanent Evacuation , Floodproof / Raise, Dam & Bridge Modification (Plan 3 & 4)
PLAN 12
Permanent Evacuation, Levee / Floodwall (Plans 1 & 11)
7
Channel, Dam & Bridge Modification (Plans 6 & 4)
PLAN 8
Channel Modification, Permanent Evacuation (Plans 7 & 1)
PLAN 9
Channel Modification, Floodproof / Raise (Plans 7 & 2)
PLAN 10
Channel Modification, Floodproof / Raise (Plan 7 & 3)
Plan 15
Channel Modification, Levee / Floodwall (Plans 7 & 13)
PLAN 16
Channel Modification, Nonstructural, Levee / Floodwall (Plans 7 & 14 , 3 & 15)
13
Levee / Floodwall, Dam & Bridge Modification (Plans 11 & 4)
PLAN 14
Permanent Evacuation, Levee / Floodwall, Dam & Br. Mod, Flood / Raise (Plans 1 & 13 , 3 & 13)
PLAN 19
Existing & New Reservoirs (Plans 17 & 18)
PLAN 24
Existing & New Reservoirs, Tunnels (Plans 19 & 23)
Pres Nat, Storage in Combination with other Nonstructural and Structural Measures
PLAN 22
Aquifer Recharge, New & Existing Reservoirs (Plans 21 & 19)
PLAN 25
Aquifer Recharge, Tunnels (Plans 21 & 23)
PLAN 26
Aquifer Recharge, New & Existing Reservoirs, Tunnels (Plans 22 & 25)
** CHANNEL MODIFICATION AND/OR LEVEES AND FLOODWALLS REQUIRED IN PORTIONS OF CENTRAL BASIN FOR MOST TUNNEL BUILDING BLOCKS TO FUNCTION
PLAN 28
Tunnels, Floodproof / Raise, Permanent Evacuation (Plans 23 & 3)
PLAN 29
Tunnels, Channel Modification (Plans 23 & 7)
PLAN 30
Tunnels, Levee / Floodwall (Plans 23 & 13)
PLAN 31
Tunnels, Levee / Floodwall, Channel Modification (Plans 23 & 15)
PLAN 32
Tunnels, Channel Modification, Nonstructural (Plans 23 & 10)
PLAN 33
Tunnels, Levee / Floodwall, Nonstructural (Plans 23 & 14)
PLAN 34
Tunnels, Levee / Floodwall, Channel Mod, Nonstructural (Plans 23 & 16)

Passaic River Basin – Plans Compared

Plan	Cost (Millions)	Structures Protected/Acquired
100 Year Floodplain Buyout	$7,350	~13,300
50 Year Floodplain Buyout	$5,880	~11,100
25 Year Floodplain Buyout	$4,704	~9,500
10 Year Floodplain Buyout	$3,381	~7,400
Floodway Buyout	$294	~800
100 Year Authorized Tunnel Diversion Plan	$2,793	over 14,000
Levees, Floodwalls, Nonstructural Measures, some Bridge and Dam Modifications (14A)	$840	10 to 100 year level of protection
Levees, Floodwalls, Nonstructural Measures and Channel Modification, some Bridge and Dam Modifications (16A)	$961	10 to 100 year level of protection

October 2011 Price Levels

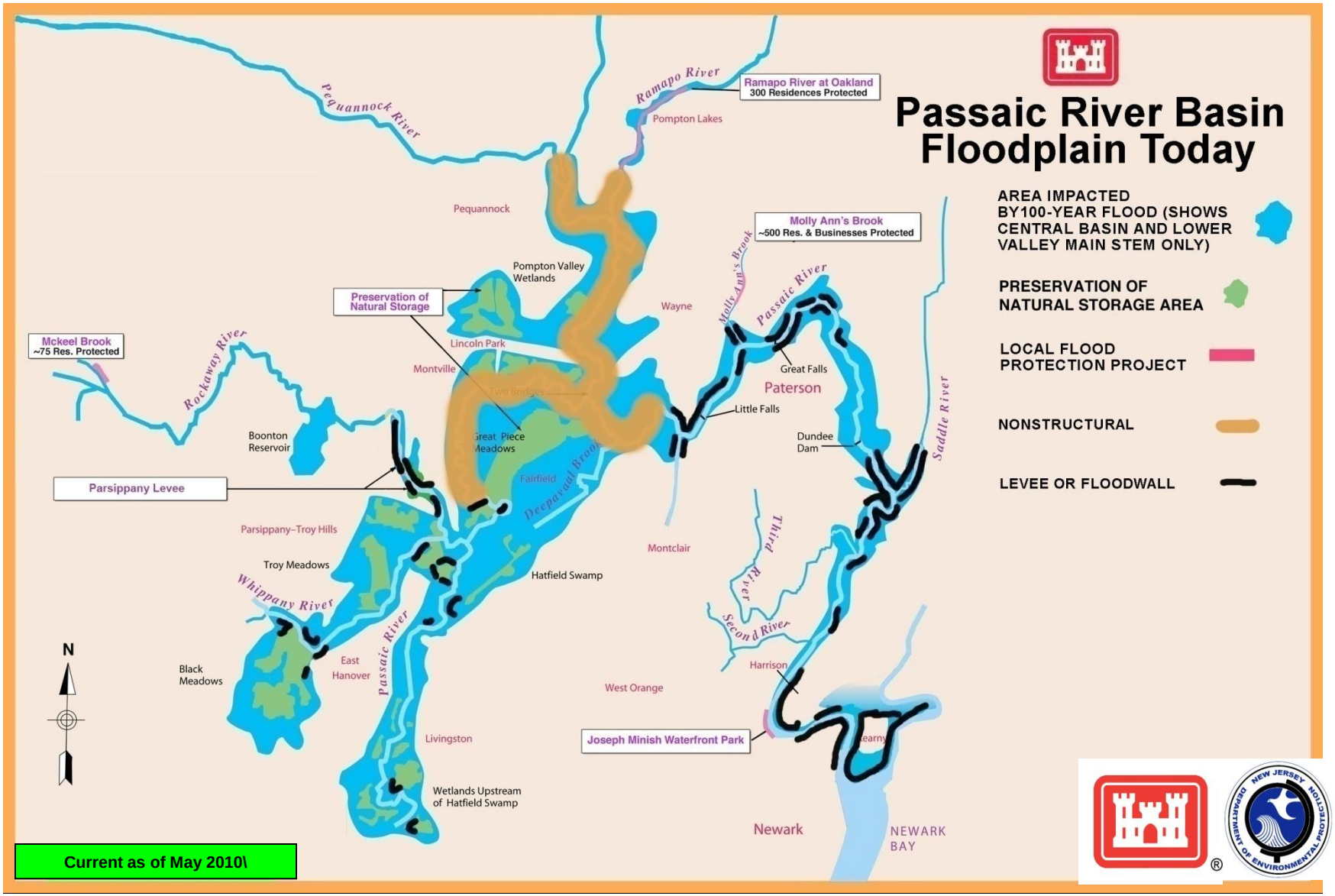
Passaic River Basin
Next Steps

- Continue to Support New Jersey as they implement the recommendations made by the Governor's Flood Advisory Commission (Jan 2011)
- Execute Feasibility Cost Sharing Agreement with NJDEP for a reevaluation for the Passaic River Basin (13 June 2012)
- Conceptual Phase Draft Report (Jun/Jul 2013)
- Public Outreach (Jul – Oct 2013)

Passaic River General Reevaluation Conceptual Phase – 6 Alternatives

- Comprehensive system of levees, floodwalls, nonstructural measures, some bridge and dam modifications (alternative 14A from 1987)
- Comprehensive system of levees, floodwalls, nonstructural measures, channel modification, some bridge and dam modifications (alternative 16A from 1987)
- 1990 authorized plan (dual inlet tunnel, alternative 30E)
- Improvements to Beatties Dam and Two Bridges
- Nonstructural – 10 year
- No Action

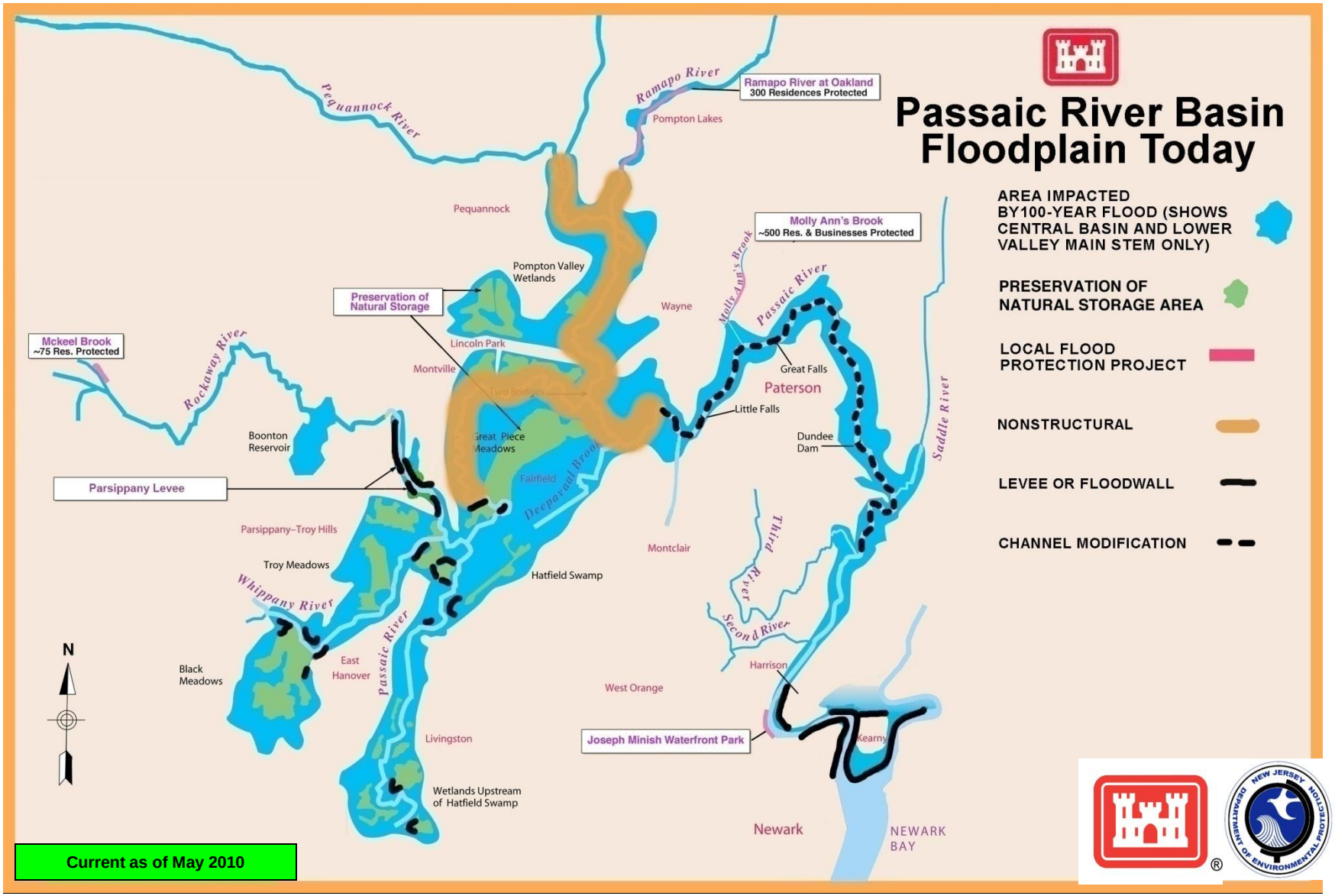
Plan 14A – Levee/Floodwall, Nonstructural, some Dam and Bridge Modification



Plan 14A – Levee/Floodwall, Nonstructural, some Dam and Bridge Modification

- Nonstructural measures (flood proofing, raising, buyout) for 6,000 structures
- No channel improvements
- 24 miles of levees
  - Heights ranging from 3’ to 17’
- 17 miles of flood walls
  - Heights ranging from 5’ to 22’
- 46 pump stations

Plan 16A – Levee/Floodwall, Nonstructural, Channel Modification, some Dam and Bridge Modification



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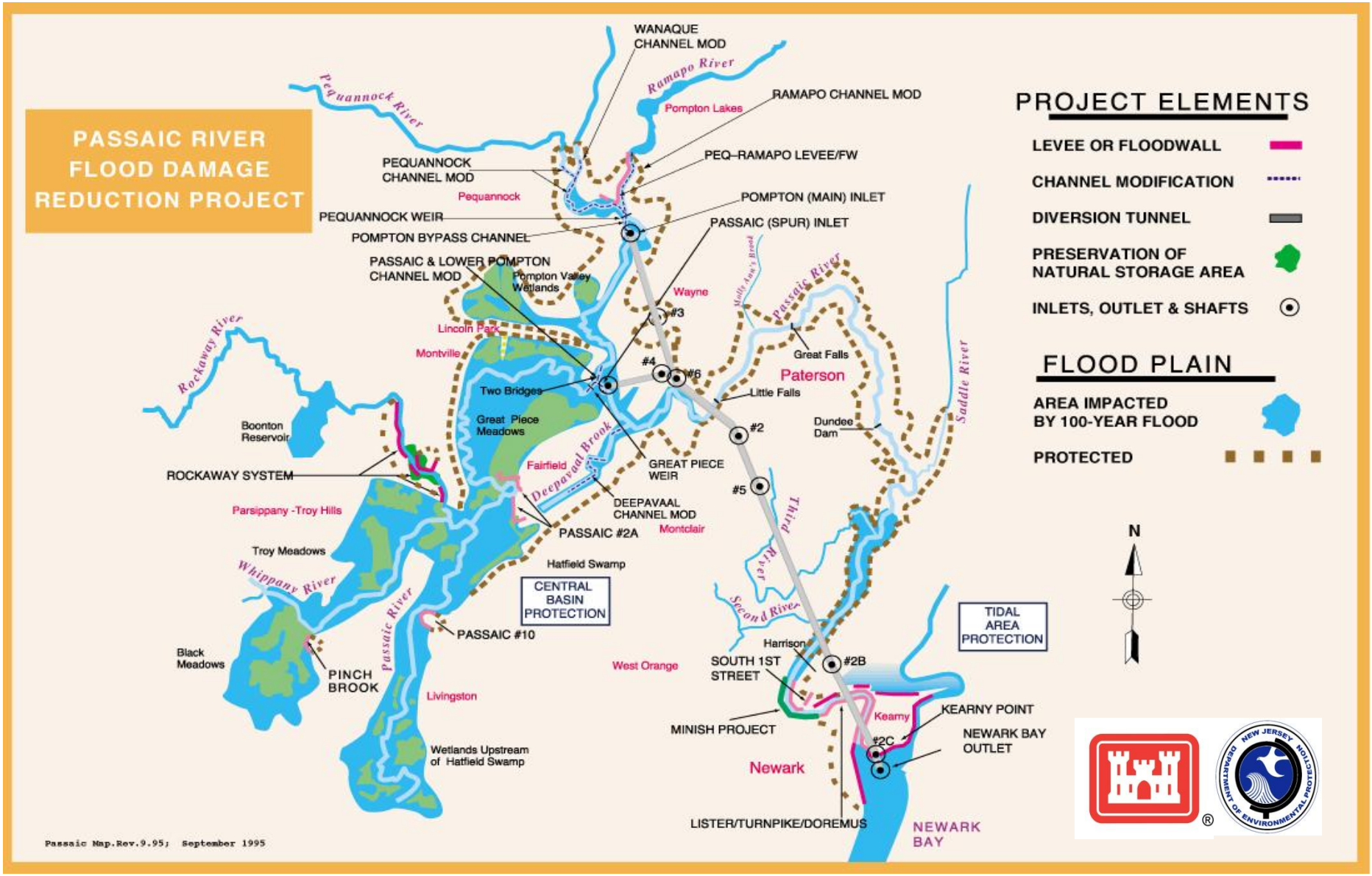
Plan 16A – Levee/Floodwall, Nonstructural, Channel Modification, some Dam and Bridge Modification

- Nonstructural measures (flood proofing, raising, buyout) for 6,000 structures
- 16.5 miles of channel improvements
- 20 miles of levees
  - Heights ranging from 4’ to 17’
- 9 miles of flood walls
  - Heights ranging from 7’ to 14’
- 22 pump stations

Passaic River Basin WRDA 1990 Authorized Plan (30E) as designed in September 1995



Passaic River Basin
WRDA 1990 Authorized Plan (30E)
as designed in September 1995

- 20 mile, 42 ft. dia. main diversion tunnel
- 1.2 mile, 23 ft. dia. spur tunnel
- 7 miles of channel improvements
- 7 miles of levees
- 13 miles of flood walls
- 15 pump stations

Modification of Beatties Dam and Two Bridges

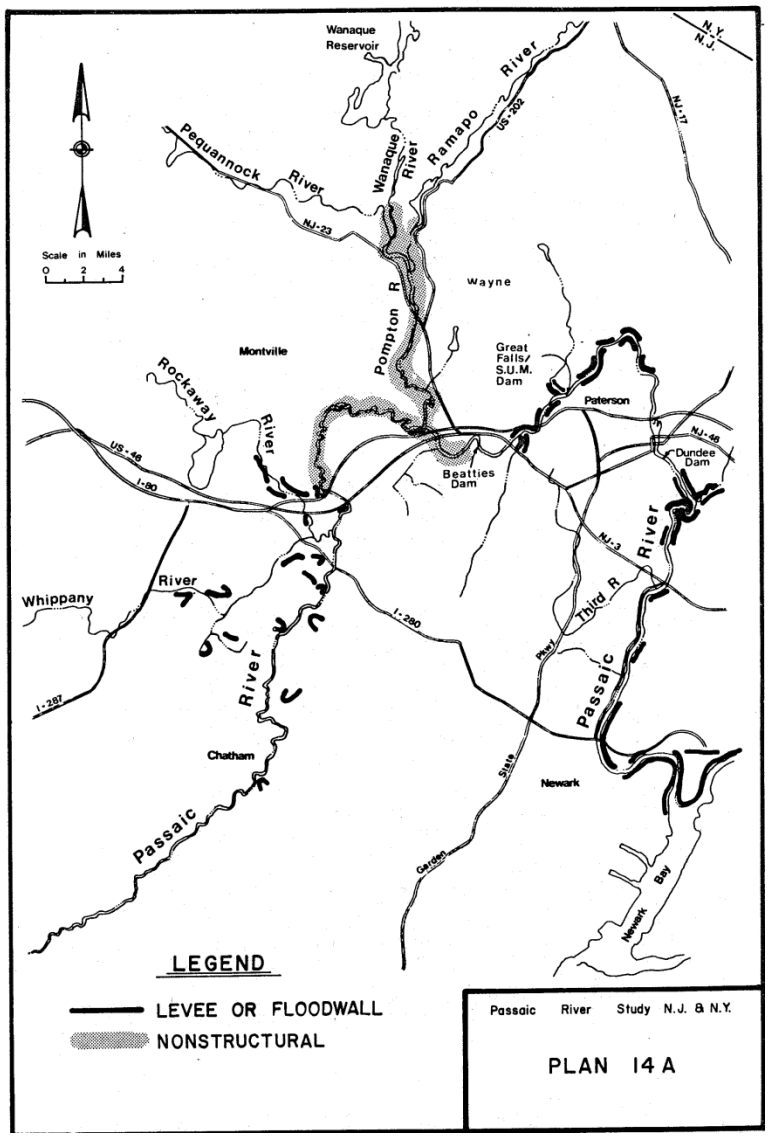
- The following will be considered:
  - Removing a portion or all of Beatties Dam
  - Placing gates on Beatties Dam
  - A weir or structure near the confluence of the Pompton and Passaic Rivers to regulate the flow
  - Channel modification

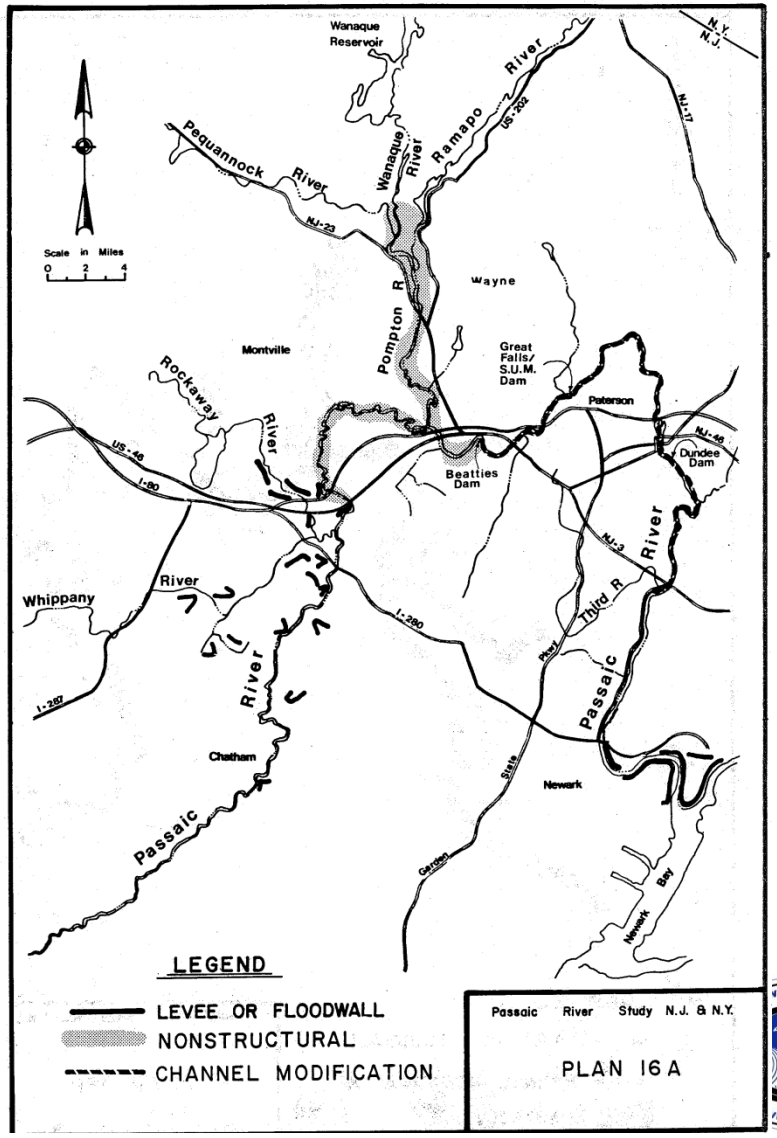
Passaic River General Reevaluation Conceptual Phase

- NJDEP will have the opportunity to determine alternative(s) on which to proceed on the basis of conceptual costs and economics, environmental requirements and public input

- Public Outreach with NJDEP:
  - Two Public Study Kick-off Meetings:
    - July 11, 2012
    - September 13, 2012
  - Ten Public Outreach Meetings (Jul-Oct 2013)
  - Plan Sheets and Posters geared towards different areas of the Basin
  - Visual Renderings

1987 Alternatives





Passaic River General Reevaluation Conceptual Phase Major Tasks

- Update floodplain based on 1990s UNET model and current FEMA HEC-RAS models
- Model each alternative for reduction in water surface levels (level of protection may have changed)
- Comparative cost estimates
- Economic screening of alternatives
  - Damages prevented (benefits) vs project cost
- Identify threatened or endangered species, known historic resources and potential wetland and riverine habitats.
- Review existing literature
- Coordinate with NJDEP, USFWS, other NGOs, etc
- Architectural renderings, photographs and cross-section posters of typical project features
- Public Outreach

Passaic River General Reevaluation Conceptual Phase Recent Tasks

- 11 July 2012 Public Information Session
- Passaic River Website

- Technical Tasks:
  - Hydrology:
  - Received FEMA HMS models from NJDEP
  - Rainfall data was collected from Irene
  - Developing calibrated runs for Irene
  - Coordination with the NJ Silver Jackets Team
  - Hydraulics:
  - 1990s UNET model converted to HEC-RAS
  - Received FEMA HEC-RAS models for the Central/Lower Basin, Pompton and Ramapo Rivers

- Passaic River Resources
  - www.nj.gov/dep/passaicriver
  - http://bit.ly/passaicstudy
- Information about the poster boards
- Introduction of the Team Members
- Comment period

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